

What is claimed is:

1. Communication device for generating data packets  
having a first data structure determined by a first  
5 predetermined protocol, which is arranged to receive data  
packets of a second structure determined by a  
predetermined second protocol and generating said data  
packets of said first structure by embedding each data  
packet of said second structure in one or more data  
10 packets of said first structure, and which comprises a  
discriminator means that is arranged to discriminate said  
data packet of said second structure according to  
predetermined rules, on the basis of the contents of said  
data packets of said second structure.  
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2. Communication device according to claim 1,  
  
said first predetermined protocol supporting at least two  
transmission reliability modes according to which data  
20 packets are sent, where said transmission reliability  
modes are distinguishable at least with respect to rules  
regarding the retransmission of data packets, and where  
each generated data packet contains information on the  
transmission reliability mode according to which said each  
25 data packet is to be sent, such that a receiver of said  
each data packet may determine according to which of said  
transmission reliability modes said each data packet was  
sent, and said information on the transmission reliability  
mode is set in said each data packet by said communication  
30 device prior to sending said each data packet, and  
  
said discriminator means being arranged to discriminate a  
given data packet of said second structure according to  
said predetermined rules, such that the information on the  
35 transmission reliability mode in the one or more data  
packets of said first structure containing said given data

packet of said second structure is set in accordance with the discrimination result.

3. Communication device according to claim 2, wherein  
5 said first protocol supports two transmission reliability modes, which are a first mode that comprises rules for the retransmission of data packets under predetermined conditions, and a second mode that does not provide for the retransmission of data packets.  
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4. Communication device according to claim 1,  
wherein said communication device is arranged to segment  
said data packets of said second structure in said data  
packets of said first structure.  
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5. Communication device according to claim 1,  
wherein said communication device is arranged to  
encapsulate said data packets of said second structure in  
said data packets of said first structure.  
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6. Communication device according to claim 1,  
further comprising an output buffer, into which the data  
packets of said first structure are passed, and from which  
said packets are sent out.  
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7. Communication device according to claim 2,  
further comprising an output buffer, into which the data  
packets of said first structure are passed and said output  
buffer being arranged to place each data packet of said  
30 first structure in a queue associated with the  
transmission reliability mode set in said each packet.
8. Communication device according to claim 7, wherein  
said first protocol supports two transmission reliability  
35 modes, which are a first mode that comprises rules for the retransmission of data packets under predetermined conditions, and a second mode that does not provide for

the retransmission of data packets, and said output buffer is arranged to send out data packets of said first mode that are to be retransmitted with a higher priority than other data packets.

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9. Communication device according to claim 1, wherein said data packets of said second structure transport one or more sections carrying information on the contents of the packet, and said discriminator means is arranged to analyze said one or more sections to thereby discriminate said data packets of said second structure in accordance with their contents.

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10. Communication device according to claim 9, wherein said one or more sections are packet headers associated with respective protocol layers and containing protocol identification information identifying the protocol with which the contents of the packet are associated.

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11. Communication device according to claim 2, wherein said data packets of said second structure have one or more sections carrying information on the contents of the packet, and said discriminator means is arranged to analyze said one or more sections to thereby discriminate said data packets of said second structure in accordance with their contents, where said one or more sections are packet headers associated with respective protocol layers and containing protocol identification information identifying the protocol with which the contents of the packet are associated, and said packet headers form a hierarchy in accordance with the protocol layers, and, for a packet to be discriminated, said discriminator means is arranged to

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first determine the protocol identification in the header associated with said second protocol and then compare said protocol identification with stored rules that allocate a

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predetermined transmission reliability mode to  
predetermined protocol identifications,

5 set the transmission reliability mode for said packet to  
be discriminated in accordance with a determined  
allocation if said protocol identification is among the  
stored rules, and if said protocol identification is not  
among the stored rules, then determine the protocol  
10 identification in the header associated with the next  
protocol one layer up in the hierarchy and then compare  
said protocol identification of said next protocol with  
said stored rules that allocate a predetermined  
transmission reliability mode,  
where said process of determining and comparing is  
15 repeated until one of

a determined protocol identification in said packet  
to be discriminated is allocated to a predetermined  
transmission reliability mode according to one of the  
20 rules, in which case said transmission reliability  
mode is set for said packet to be discriminated, and

a fail-safe condition is met, in which case a default  
transmission reliability mode is set for said packet  
25 to be discriminated.

12. Communication device according to claim 3, wherein  
said first protocol specifies performing segmentation in  
order to embed said packets of said second data structure  
30 in said packets of said first structure.

13. Communication device according to claim 1,  
wherein said first protocol is a protocol for sending  
packets over a link.  
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14. Communication device according to claim 13, wherein  
said link is a radio link.

15. Communication device according to claim 13,  
wherein said communication device is arranged to also  
receive data packets of said first structure over said  
link.

16. Communication device according to claim 12, wherein  
said first protocol is a protocol for sending packets over  
a link and said communication device is arranged to also  
receive data packets of said first structure over said  
link, and in that a receiving buffer means is provided for  
receiving said data packets of said first structure over  
said link, where said receiving buffer means comprises a  
first part associated with said first transmission  
reliability mode for storing data packets sent in  
accordance with said first transmission reliability mode,  
and a second part associated with said second transmission  
reliability mode for storing data packets sent in  
accordance with said second transmission reliability mode.

17. Communication device according to claim 16,  
being adapted to determine the occurrence of a packet  
delimiter belonging to a packet of said second data  
structure in received packets of said first data  
structure, and said receiving buffer being adapted to  
store said received packets of said first data structure  
until one of

a complete packet of said second data structure has been  
received, which is determined by the receipt of packet  
delimiters belonging to packets of said second data  
structure, and,

for packets of said first data structure belonging to said  
second transmission reliability mode, a predetermined  
buffer limit is exceeded.

18. Communication device according to claim 12,  
being adapted to determine the occurrence of a packet  
delimiter belonging to a packet of said second data  
structure in packets of said second data structure that  
5 are to be embedded, and to duplicate said packet  
delimiters prior to embedding.
19. Communication device according to claim 16,  
said first transmission reliability mode being such that  
10 packets of said first transmission reliability mode are  
numbered to thereby specify a correct order, and
- said communication device being adapted to determine the  
occurrence of a packet delimiter belonging to a packet of  
15 said second data structure in received packets of said  
first data structure belonging to said first transmission  
reliability mode,
- said receiving buffer being adapted to immediately release  
20 received packets of said first data structure, both those  
belonging to said first and said second transmission  
reliability mode, to the next higher layer, except if
- 25 - packets belonging to said first transmission  
reliability mode need to be retransmitted, in which  
case the received packets belonging to said first  
transmission reliability mode are buffered until they  
can be released in the correct order, and
  - 30 - packets belonging to said first transmission  
reliability mode are followed by packets belonging to  
said second transmission reliability mode, in which  
case said receiving buffer is adapted to immediately  
release received packets of said first data structure  
35 belonging to said second transmission reliability  
mode if no packets of said first transmission  
reliability mode are being stored, and to store

received packets of said first data structure  
belonging to said second transmission reliability  
mode if packets of said first transmission  
reliability mode are being stored, until a complete  
5 packet of said second data structure and first  
transmission reliability mode has been received and  
released, after which the stored packets of said  
first data structure belonging to said second  
transmission reliability mode are released.

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20. Communication device according to claim 17,  
said predetermined packet delimiter being specified by a  
message received over said link..

15 21. Communication device according to claim 12, wherein  
said first protocol is a protocol for sending packets over  
a link,

20 the retransmission of packets belonging to said first  
transmission reliability mode is decided on the basis of  
acknowledgment packets for packets already sent over said  
link, and

25 an output buffer means is provided that is adapted to send  
out packets belonging to said second transmission  
reliability mode only if the receipt of all previously  
sent packets of said first transmission reliability mode  
has been acknowledged.

30 22. Communication device according to claim 1, wherein  
said first predetermined protocol supports at least two  
operation modes according to which data packets are sent,  
said discriminator means comprises a controlling means,  
where said controlling means discriminates said data  
35 packets of said second structure on the basis of their  
contents and maps them to an operation mode on the basis  
of the discrimination result, and generates adaptation

control data on the basis of said discrimination result,  
and where an adapting means is provided for selecting one  
of said at least two operating modes in response to said  
adaptation control data.

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23. Communication device according to claim 22, wherein  
said adapting means is additionally arranged to take into  
account data associated with the link over which said data  
packets of said first structure are sent when selecting  
10 one of said at least two operating modes in response to  
said adaption control data.

24. Communication device according to claim 22,  
wherein said controlling means discriminates said data  
15 packets of said second structure on the basis of the  
contents of a predetermined field in the header of said  
data packets of said second structure.

25. Communication device according to claim 24, wherein  
20 said predetermined field carries transmission quality  
requests as a part of said data packets of said second  
structure.

26. Communication device according to claim 22,  
25 wherein said operating modes are associated with at least  
one of automatic repeat request error recovery and forward  
error correction.

27. Communication device according to claim 26, wherein  
30 said forward error correction comprises one or more of  
frame check sequence based error detection, forward error  
control based error correction, interleaving-based error  
prevention, power control, spreading-based error  
prevention, frame length control, and bandwidth  
35 reservation control.



28. Method for generating data packets having a first data structure determined by a first predetermined protocol, comprising:

5       - discriminating received data packets of a second structure determined by a second predetermined protocol according to predetermined rules, on the basis of the contents of said data packets of said second structure, and

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      - embedding data packets of said second structure in data packets of said first structure.

15       29. Method for generating data packets according to claim 28, said first predetermined protocol supporting at least two transmission reliability modes according to which data packets may be sent, where said transmission reliability modes are distinguishable at least with respect to rules regarding the retransmission of data packets, and where  
20       each generated data packet contains information on the transmission reliability mode according to which said each data packet is to be sent, such that a receiver of said each data packet may determine according to which of said transmission reliability modes said each data packet was  
25       sent, and

      the information on the transmission reliability mode in a data packet of said first structure containing a given data packet of said second structure being set in  
      accordance with the result of said discriminating step for  
30       said given data packet of said second structure.

35       30. Method according to claim 29, wherein said first protocol supports two transmission reliability modes, which are a first mode that comprises rules for the retransmission of data packets under predetermined conditions, and a second mode that does not provide for the retransmission of data packets.

31. Method according to claim 28, wherein  
said data packets of said second structure are  
encapsulated in said data packets of said first structure.
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32. Method according to claim 28, wherein  
said data packets of said second structure are segmented  
in said data packets of said first structure.
- 10 33. Method according to claim 28, wherein  
said data packets of said first structure is passed into  
an output buffer.
34. Method according to claim 29, said data  
15 packets of said first structure being passed into an  
output buffer, and said output buffer placing each data  
packet of said first structure in a queue associated with  
the transmission reliability mode set in said each packet.
- 20 35. Method according to claim 34, wherein  
said first protocol supports two transmission reliability  
modes, which are a first mode that comprises rules for the  
retransmission of data packets under predetermined  
conditions, and a second mode that does not provide for  
25 the retransmission of data packets, and said output buffer  
sends out data packets of said first mode that are to be  
retransmitted with a higher priority than other data  
packets.
- 30 36. Method according to claim 28, wherein  
said data packets of said second structure transport one  
or more sections carrying information on the contents of  
the packet, and said discrimination step comprises  
analyzing said one or more sections to thereby  
35 discriminate said data packets of said second structure in  
accordance with their contents.

37. Method according to claim 36, wherein  
said one or more sections are packet headers associated  
with respective protocol layers and containing protocol  
identification information identifying the protocol with  
5 which the contents of the packet are associated.

38. Method according to claim 29, wherein

10 said data packets of said second structure have one or  
more sections carrying information on the contents of the  
packet, and said discrimination step comprises analyzing  
said one or more sections to thereby discriminate said  
data packets of said second structure in accordance with  
their contents,

15 said one or more sections are packet headers associated  
with respective protocol layers and containing protocol  
identification information identifying the protocol with  
which the contents of the packet are associated, and

20 said packet headers form a hierarchy in accordance with  
the protocol layers, and, for a packet to be  
discriminated, said discrimination step includes

25 - first determining the protocol identification in the  
header associated with said second protocol and then  
comparing said protocol identification with stored rules  
that allocate a predetermined transmission reliability  
mode to predetermined protocol identifications,

30 - setting the transmission reliability mode for said  
packet to be discriminated in accordance with a determined  
allocation if said protocol identification is among the  
stored rules, and if said protocol identification is not  
35 among the stored rules, then determining the protocol  
identification in the header associated with the next  
protocol one layer up in the hierarchy and then comparing

said protocol identification of said next protocol with  
said stored rules that allocate a predetermined  
transmission reliability mode,  
where said process of determining and comparing is  
5 repeated until one of

-- a determined protocol identification in said  
packet to be discriminated is allocated to a  
predetermined transmission reliability mode according  
10 to one of the rules, in which case said transmission  
reliability mode is set for said packet to be  
discriminated, and

-- a fail-safe condition is met, in which case a  
15 default transmission reliability mode is set for said  
packet to be discriminated.

39. Method according to claim 30, wherein  
said first protocol specifies performing segmentation in  
20 order to embed said packets of said second data structure  
in said packets of said first structure.

40. Method according to claim 28, wherein  
said first protocol is a protocol for sending packets over  
25 a link.

41. Method according to claim 40, wherein  
said link is a radio link.

30 42. Method according to claim 40, further  
receiving data packets of said first structure over said  
link.

43. Method according to claim 39, wherein  
35 said first protocol is a protocol for sending packets over  
a link,

data packets of said first structure are also received over said link, and

5 a receiving buffer means is used, for receiving said data packets of said first structure over said link, where said receiving buffer means comprises a first part associated with said first transmission reliability mode for storing data packets sent in accordance with said first  
10 transmission reliability mode, and a second part associated with said second transmission reliability mode for storing data packets sent in accordance with said second transmission reliability mode.

15 44. Method according to claim 43, further comprising determining the occurrence of a packet delimiter belonging to a packet of said second data structure in received packets of said first data structure, and said receiving buffer storing said received packets of said first data  
20 structure until one of

a complete packet of said second data structure has been received, which is determined by the receipt of packet delimiters belonging to packets of said second data  
25 structure, and,

for packets of said first data structure belonging to said second transmission reliability mode, a predetermined buffer limit is exceeded.

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45. Method according to claim 39, further comprising determining the occurrence of a packet delimiter belonging to a packet of said second data structure in packets of said second data structure that are to be embedded, and  
35 duplicating said packet delimiters prior to embedding.

46. Method according to claim 43,  
said first transmission reliability mode being such that  
packets of said first transmission reliability mode are  
numbered to thereby specify a correct order, and further  
5 comprising

determining the occurrence of a packet delimiter belonging  
to a packet of said second data structure in received  
packets of said first data structure belonging to said  
10 first transmission reliability mode,

said receiving buffer immediately releasing received  
packets of said first data structure, both those belonging  
to said first and said second transmission reliability  
15 mode, to the next higher layer, except if

- packets belonging to said first transmission  
reliability mode need to be retransmitted, in which  
case the received packets belonging to said first  
20 transmission reliability mode are buffered until they  
can be released in the correct order, and

- packets belonging to said first transmission  
reliability mode are followed by packets belonging to  
25 said second transmission reliability mode, in which  
case said receiving buffer is adapted to immediately  
release received packets of said first data structure  
belonging to said second transmission reliability  
mode if no packets of said first transmission  
30 reliability mode are being stored, and to store  
received packets of said first data structure  
belonging to said second transmission reliability  
mode if packets of said first transmission  
reliability mode are being stored, until a complete  
35 packet of said second data structure and first  
transmission reliability mode has been received and  
released, after which the stored packets of said

first data structure belonging to said second transmission reliability mode are released.

47. Method according to claim 44, said predetermined packet  
5 delimiter being specified by a message received over said link.

48. Method according to claim 39, wherein  
10 said first protocol is a protocol for sending packets over a link,

the retransmission of packets belonging to said first transmission reliability mode is decided on the basis of acknowledgment packets for packets already sent over said  
15 link, and

an output buffer means is provided that sends out packets belonging to said second transmission reliability mode only if the receipt of all previously sent packets of said  
20 first transmission reliability mode has been acknowledged.

49. Method according to claim 28, wherein  
25 said first predetermined protocol supports at least two operation modes according to which data packets are sent, a controlling process and an adapting process are provided, where said controlling process discriminates said data packets of said second structure on the basis of their contents and maps them to an operation mode on the  
30 basis of the discrimination result, and generates adaptation control data on the basis of said discrimination result, and where said adapting process selects one of said at least two operating modes in response to said adaptation control data.

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50. Method according to claim 49, wherein  
said adapting process additionally takes into account data  
associated with the link over which said data packets of  
said first structure are sent when selecting one of said  
5 at least two operating modes in response to said adaption  
control data.
51. Method according to claim 49, wherein  
said controlling process discriminates said data packets  
10 of said second structure on the basis of the contents of a  
predetermined field in the header of said data packets of  
said second structure.
52. Method according to claim 51, wherein  
15 said predetermined field carries transmission quality  
requests as a part of said data packets of said second  
structure.
53. Method according to claim 49, wherein  
20 said operating modes are associated with at least one of  
automatic repeat request error recovery and forward error  
correction.
54. Method according to claim 51, wherein  
25 said forward error correction comprises at least one of  
frame check sequence based error detection, forward error  
control based error correction, interleaving-based error  
prevention, power control, spreading-based error  
prevention, frame length control, and bandwidth  
30 reservation control.
55. Communication device for generating data packets  
having a first data structure determined by a first  
predetermined protocol, which is arranged to receive data  
35 packets of a second structure determined by a  
predetermined second protocol and generating said data  
packets of said first structure by embedding each data



packet of said second structure in one or more data  
packets of said first structure, and which comprises a  
discriminator that is arranged to discriminate said data  
packet of said second structure according to predetermined  
5 rules, on the basis of the contents of said data packets  
of said second structure.

56. Communication device for generating data packets  
having a first data structure determined by a first  
10 predetermined protocol, which is arranged to receive data  
packets of a second structure determined by a  
predetermined second protocol and generating said data  
packets of said first structure by embedding each data  
packet of said second structure in one or more data  
15 packets of said first structure, and which comprises a  
discriminator that is arranged to discriminate said data  
packet of said second structure according to predetermined  
rules, on the basis of the contents of said data packets  
of said second structure, further comprising an output  
20 buffer, into which the data packets of said first  
structure are passed, and from which said packets are sent  
out, wherein said first protocol supports at least two  
transmission reliability modes, which are a first mode  
that comprises rules for the retransmission of data  
25 packets under predetermined conditions, and a second mode  
that does not provide for the retransmission of data  
packets.